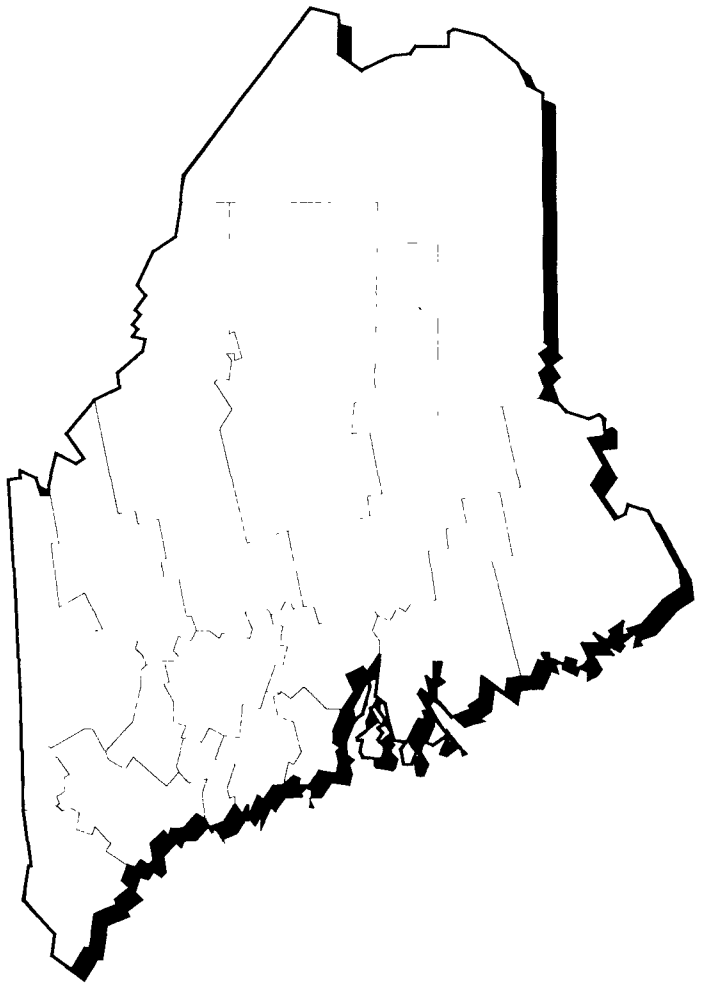
EPA

United States
Environmental Protection
Agency

Solid Waste And
Emergency Response
(5102 G)

EPA/540/R-93/018
December 1992
PB93-963219

SUPERFUND: Progress at National Priority List Sites



MAINE 1992 UPDATE

Printed on Recycled Paper

Publication #9200.5-720B
December 1992

NATIONAL PRIORITIES LIST SITES:

Maine

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Emergency & Remedial Response
Office of Program Management
Washington, DC 20460

If you wish to purchase copies of any additional State volumes, contact:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
(703) 486-4650

The complete set of the 49 State reports may be ordered as PB93-963250.

TABLE OF CONTENTS

INTRODUCTION

A BRIEF OVERVIEW OF SUPERFUND

During the second half of the Twentieth Century, the environmental consequences of more than 100 years of industrialization in the United States became increasingly clear. Authors such as Rachel Carson wrote passionately about the often-hidden environmental effects of our modern society's widespread use of chemicals and other hazardous materials. Their audience was small at first, but gradually their message spread. Growing concern turned to action, as people learned more about the environment and began to act on their knowledge

The 1970s saw environmental issues burst onto the national scene and take hold in the national consciousness. The first Earth Day was observed in 1970, the year that the U.S. Environmental Protection Agency (EPA) was founded. By the end of the 1970s, Love Canal in New York and the Valley of the Drums in Kentucky had entered the popular lexicon as synonyms for pollution and environmental degradation.

Superfund Is Established

The industrialization that gave Americans the world's highest standard of living also created problems that only a national program could address. By 1980, the U.S. Congress had passed numerous environmental laws, implemented by the EPA, but many serious hazardous waste problems were slipping through the cracks.

Responding to growing concern about public health and environmental threats from uncontrolled releases of hazardous materials, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Popularly known as Superfund, CERCLA had one seemingly simple job—to uncover and clean up hazardous materials spills and contaminated sites.

A Big Job

Few in Congress, the EPA, the environmental community, or the general public knew in 1980 just how big the nation's hazardous materials problem is. Almost everyone thought that Superfund would be a short-lived program requiring relatively few resources to clean up at most a few hundred sites. They were quite mistaken.

As the EPA set to work finding sites and gauging their potential to harm people and the environment, the number of sites grew. Each discovery seemed to lead to another, and today almost 36,000 hazardous waste sites have been investigated as potential hazardous waste sites. They are catalogued in the EPA's computerized database, CERCLIS (for the Comprehensive Environmental Re-

sponse, Compensation, and Liability Information System).

The damage to public health and the environment that each site in CERCLIS might cause is evaluated; many sites have been referred to State and local governments for cleanup. The EPA lists the nation's most serious hazardous waste sites on the National Priorities List, or NPL. (These Superfund sites are eligible for federally-funded cleanup, but whenever possible the EPA makes polluters pay for the contamination they helped create.) The NPL now numbers 1,275 sites, with 50 to 100 added each year. By the end of the century, the NPL may reach as many as 2,100 sites.

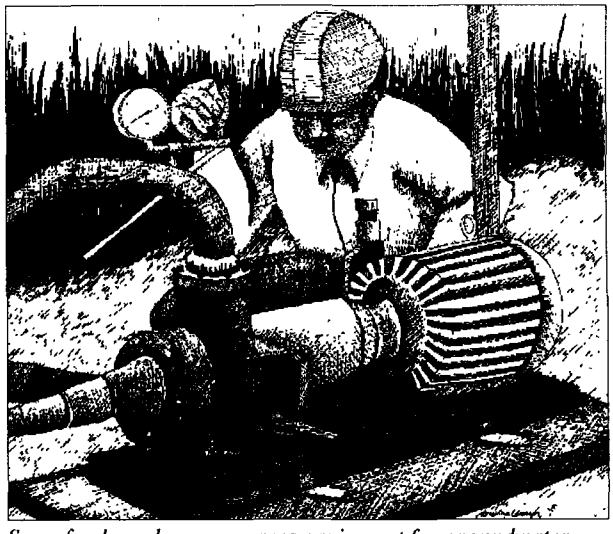
Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking water that are contaminated by chemicals spreading through the soil or mixing with storm water runoff. Toxic vapors contaminate the air at some sites, threatening the health of people living and working near by.

Superfund aims to control immediate public health and environmental threats by tackling the worst problems at the worst sites first. Wherever possible, Superfund officials use innovative treatment techniques—many developed or refined by the EPA—to correct hazardous materials problems once and for all. Many of the treatment techniques they use did not exist when the program was created.

The EPA Administrator had challenged Superfund to complete construction necessary for cleanup work at 130 NPL sites by the end of the 1992 federal fiscal year. By September 30, 1992, the end of fiscal year 1992, construction had been completed at a total of 149 NPL sites. Superfund is well on its way of meeting the Administrator's goal of completing construction at 200 NPL sites by the end of fiscal year 1993, and 650 sites by the end of fiscal year 2000.

Quick Cleanup at Non-NPL Sites

Long-standing hazardous waste sites are not Superfund's only concern. The EPA also responds to hazardous spills and other emergencies, hauling away chemicals for proper treatment or disposal. Superfund teams perform or supervise responses at rail and motor vehicle accidents, fires, and other emergencies involving hazardous substances. They also evacuate people living and working near by, if necessary, and provide clean drinking water to people whose own water is contaminated. Removal crews also post warning signs and take other precautions to keep people and animals away from hazardous substances.



Superfund employee prepares equipment for groundwater treatment.

Quick Cleanups, or Removals, are not limited to emergencies. When cleanup crews at contaminated sites find hazardous substances that immediately threaten people or the environment, they act right away to reduce the threat or to remove the chemicals outright. As the EPA implements the Superfund Accelerated Cleanup Model (SACM), more and more sites will undergo quick cleanups, and many of these will be cleaned up completely without ever being included on the NPL. (See "Streamlining Superfund: The Superfund Accelerated Cleanup Model.")

Some of Superfund's most significant gains in public health and environmental protection have been won by the removal program. As of March 31, 1992, the Emergency Response Program had logged more than 2,300 removal completions since Superfund was established.

Superfund employee removing drums from a Superfund site.

The Public's Role

Superfund is unique among federal programs in its commitment to citizen participation. Although the EPA is responsible for determining how dangerous a site is and how best to clean it up, the Agency relies on citizen input as it makes these decisions.

Community residents are often invaluable sources of information about a hazardous waste site, its current and previous owners, and the activities that took place there. Such information can be crucial to experts evaluating a site and its potential dangers.

Residents also comment on EPA cleanup plans by stating their concerns and preferences at public meetings and other forums and in formal, written comments to Agency proposals. The EPA takes these comments and concerns seriously, and has modified many proposals in response to local concerns. For, ultimately, it is the community and its citizens that will live with the results of the EPA's decisions and actions; it is only fair that citizens participate in the process.

A Commitment to Communication

The Superfund program is very serious about public outreach and communication. Community relations coordinators are assigned to each NPL site to help the public understand the potential hazards present, as well as the cleanup alternatives. Local information repositories, such as libraries or other public buildings, have been established near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans.

The individual State volumes contain summary fact sheets on NPL sites in each State and territory. Together, the fact sheets provide a concise report on site conditions and the progress made toward site cleanups as of March 1992. The EPA revises these volumes periodically to provide an up-to-date record of program activities. A glossary of key terms relating to hazardous waste management and Superfund site cleanup is provided at the back of this book.

INTRODUCTION

Superfund is, of course, a public program, and as such it belongs to everyone of us. This volume, along with other State volumes, comprises the EPA's report on Superfund progress to the program's owners for the year 1992.

STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

Historically, critics and supporters alike have measured Superfund's progress by the number of hazardous waste sites deleted from the NPL. Although easy enough to tally, this approach is too narrow. It misses the major gains Superfund makes by reducing major risks at the nation's worst hazardous sites long before all clean-up work is done and the site deleted. It also ignores the Removal Program's contributions to meeting Superfund's twin mandates of maximizing public health and environmental protection.

Renewing Superfund's commitment to rapid protection from hazardous materials, the EPA is streamlining the program. The Superfund Accelerated Cleanup Model, or SACM, will take Early Actions, such as removing hazardous wastes or contaminated materials, while experts study the site. SACM also will combine similar site studies to reduce the time required to evaluate a site and its threats to people and the environment. This way, immediate public health and environmental threats will be addressed while long-term cleanups are being planned.

Emergencies such as train derailments and motor vehicle accidents will continue to be handled expeditiously. Teams of highly trained technicians will swing into action right away, coordinating the cleanup and removal of hazardous substances to ensure public safety as quickly as possible.

Breaking With Tradition

The traditional Superfund process begins with a lengthy phase of study and site assessment, but SACM will save time by combining separate, yet similar, activities. Each EPA Region will form a Decision Team of site managers, risk assessors, community relations coordinators, lawyers, and other experts to monitor the studies and quickly determine whether a site requires Early Action (taking less than five years), Long-term Action, or both.

While the site studies continue, the Decision Team will begin the short-term work required to correct immediate public health or environmental threats from the site. Besides removing hazardous materials, Early Actions include taking precautions to keep contaminants from moving off the site and restricting access to the site. Early Actions could eliminate most human risk from these sites, and Superfund will further focus its public participation and public information activities on site assessment and Early Action.

Long-Term Solutions

While Early Actions can correct many hazardous waste problems—and provide the bulk of public health and environmental protection—some contamination will take longer to correct. Cleanups of mining sites, wetlands, estuaries, and projects involving incineration of contaminants or restoration of groundwater can take far longer than the three to five years envisioned for Early Actions. Under SACM, these sites will be handled much as they are now.

Also under SACM, the EPA will continue its pursuit of potentially responsible parties who may have caused or contributed to site contamination. Expedited enforcement and procedures for negotiating potentially responsible party settlements will secure their participation. Superfund personnel will continue to oversee clean-up work performed by potentially responsible parties.

HOW SUPERFUND WORKS

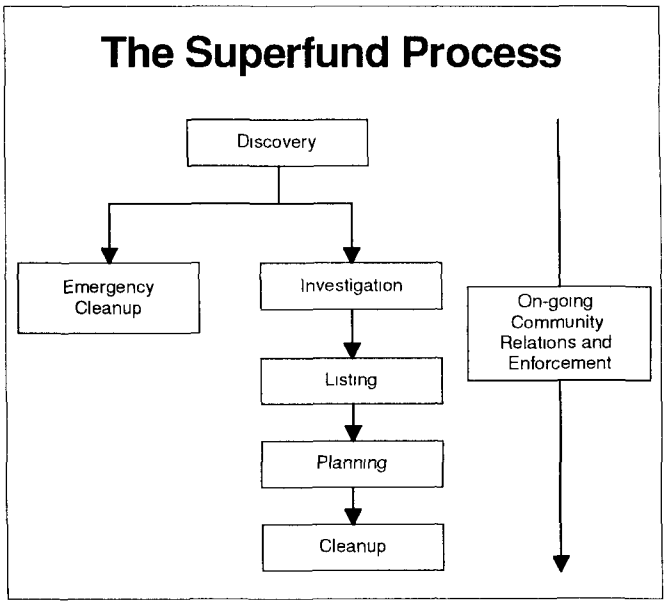
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site. Contaminants may travel through the soil and reach underground aquifers which may be used for drinking water, or they may spread over the site to contaminate streams, ponds, and wetlands. The contaminating chemicals may interact with each other, presenting even more complicated cleanup problems.

Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

The average NPL site takes from seven to ten years to work its way through the system, from discovery to the start of long-term cleanup. Actual cleanup work can take years, decades if contaminated groundwater must be treated. Of course, imminent threats to public health or the environment are corrected right away.

The diagram to the right presents a simplified view of the cleanup process. The major steps in the Superfund process are:

- Site discovery and investigation to identify contaminants and determine whether emergency action is required;
- Emergency site work such as removing contaminants for proper treatment or disposal, and securing the site to keep people and animals away, if warranted by conditions at the site;
- Site evaluation to determine how people living and working nearby, and the environment, may be exposed to site contaminants;
- Detailed studies to determine whether conditions are serious enough to add the site to the National Priorities List of sites eligible for federally funded cleanup under Superfund;
- Selection, design, and implementation of a cleanup plan, after a thorough review of the most effective cleanup options, given site conditions, contaminants present, and their potential threat to public health or the environment.
- Follow-up to ensure that the cleanup work done at the site continues to be effective over the long term.



From the earliest stages, EPA investigators work hard to identify those responsible for the contamination. As their responsibility is established, the EPA negotiates with these "responsible parties" to pay for cleaning up the problem they helped create. This "enforcement first" policy saves Superfund Trust Fund monies for use in cleanups where the responsible parties cannot be identified, or where they are unable to fund cleanup work.

THE VOLUME

How to Use the State Book

The site fact sheets presented in this book are comprehensive summaries that cover a broad range of information. The fact sheets describe hazardous waste sites on the NPL and their locations, as well as the conditions leading to their listing ("Site Description"). The summaries list the types of contaminants that have been discovered and related threats to public and ecological health ("Threats and Contaminants"). "Cleanup Approach" presents an overview of the cleanup activities completed, underway, or planned. The fact sheets conclude with a brief synopsis of how much progress has been made in protecting public health and the environment. The summaries also pinpoint other actions, such as legal efforts to involve polluters responsible for site contamination and community concerns.

The fact sheets are arranged in alphabetical order by site name. Because site cleanup is a dynamic and gradual process, all site information is accurate as of the date shown on the bottom of each page. Progress always is being made at NPL sites, and the EPA periodically will update the site fact sheets to reflect recent actions and will publish updated State volumes. The following two pages show a generic fact sheet and briefly describe the information under each section.

How Can You Use This State Book?

You can use this book to keep informed about the sites that concern you, particularly ones close to home. The EPA is committed to involving the public in the decision making process associated with hazardous waste cleanup. The Agency solicits input from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may be relocated, temporary water supplies may be necessary.

Definitive information on a site can help citizens sift through alternatives and make decisions. To make good choices, you must know what the threats are and how the EPA intends to clean up the site. You must understand the cleanup alternatives being proposed for site cleanup and how residents may be affected by each one. You also need to have some idea of how your community intends to use the site in the future, and you need to know what the community can realistically expect once the cleanup is complete.

The EPA wants to develop cleanup methods that meet community needs, but the Agency only can take local concerns into account if it understands what they are. Information must travel both ways in order for cleanups to be effective and satisfactory. Please take this opportunity to learn more, become involved, and assure that hazardous waste cleanup at "your" site considers your community's concerns.

THE VOLUME

NPL LISTING HISTORY

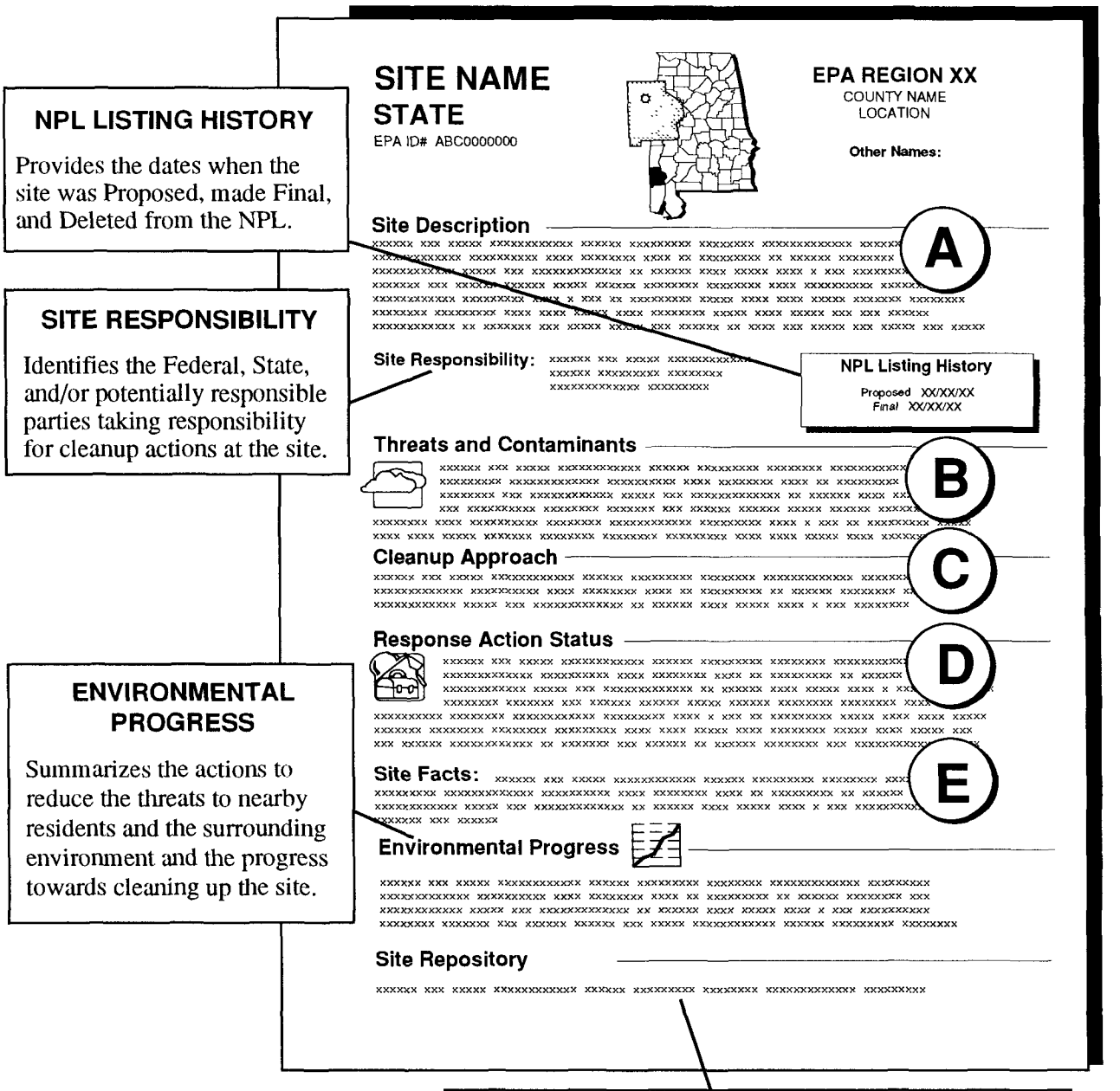
Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.

SITE RESPONSIBILITY

Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.

ENVIRONMENTAL PROGRESS

Summarizes the actions to reduce the threats to nearby residents and the surrounding environment and the progress towards cleaning up the site.



SITE REPOSITORY

Lists the location of the primary site repository. The site repository may include community relations plans, public meeting announcements and minutes, fact sheets, press releases, and other site-related documents.

A

SITE DESCRIPTION

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site.

B

THREATS AND CONTAMINANTS

The major chemical categories of site contamination are noted, as well as which environmental resources are affected. Icons representing each of the affected resources (may include air, groundwater, surface water, soil, and contamination to environmentally sensitive areas) are included in the margins of this section. Potential threats to residents and the surrounding environments arising from the site contamination also are described.

C

CLEANUP APPROACH

This section contains a brief overview of how the site is being cleaned up.

D

RESPONSE ACTION STATUS

Specific actions that have been accomplished or will be undertaken to clean up the site are described here. Cleanup activities at NPL sites are divided into separate phases, depending on the complexity and required actions at the site. Two major types of cleanup activities often are described: initial, immediate, or emergency actions to quickly remove or reduce imminent threats to the community and surrounding areas; and long-term remedial phases directed at final cleanup at the site. Each stage of the cleanup strategy is presented in this section of the summary. Icons representing the stage of the cleanup process (initial actions, site investigations, EPA selection of the cleanup remedy, engineering design phase, cleanup activities underway, and completed cleanup) are located in the margin next to each activity description.

E

SITE FACTS

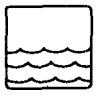
Additional information on activities and events at the site are included in this section. Often details on legal or administrative actions taken by the EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

THE VOLUME

The "icons," or symbols, accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities at the site.

Icons in the Threats and Contaminants Section

Contaminated *Groundwater* resources in the vicinity or underlying the site. (Groundwater is often used as a drinking water source.)



Contaminated *Surface Water and Sediments* on or near the site. (These include lakes, ponds, streams, and rivers.)

Contaminated *Air* in the vicinity of the site. (Air pollution usually is periodic and involves contaminated dust particles or hazardous gas emissions.)

Contaminated *Soil and Sludges* on or near the site. (This contamination category may include bulk or other surface hazardous wastes found on the site.)

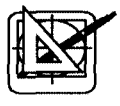
Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

Icons in the Response Action Status Section

Initial, Immediate, or Emergency Actions have been taken or are underway to eliminate immediate threats at the site.

Site Studies at the site to determine the nature and extent of contamination are planned or underway.

Remedy Selected indicates that site investigations have been concluded, and the EPA has selected a final cleanup remedy for the site or part of the site.



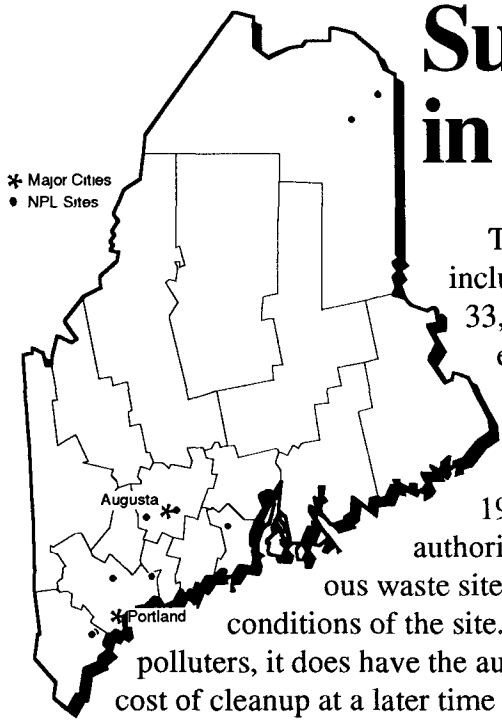
Remedy Design means that engineers are preparing specifications and drawings for the selected cleanup technologies.

Cleanup Ongoing indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.

Cleanup Complete shows that all cleanup goals have been achieved for the contaminated site or part of the site.

A SUMMARY OF THE STATE PROGRAM

Superfund Activities in Maine

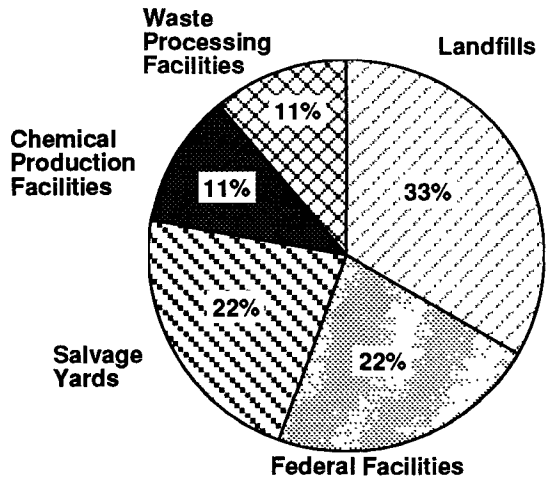


The State of Maine is located within EPA Region 1, which includes the six States of New England. The State covers 33,215 square miles. According to the 1990 Census, Maine experienced a 9 percent increase in population between 1980 and 1990, and is ranked thirty-eighth in U.S. population with approximately 1,228,000 residents.

The Uncontrolled Hazardous Substance Sites Act of 1983, amended most recently in 1990, grants the State the authority to make polluters liable for cleanup activities at hazardous waste sites regardless of fault or actual contribution to the hazardous conditions of the site. While the State prefers to negotiate agreements with polluters, it does have the authority to conduct cleanup activities itself and recover the cost of cleanup at a later time if the polluters are unable or unwilling to comply. State activities are funded by four accounts: the Uncontrolled Sites Fund, the Uncontrolled Substances Sites Bond Account, the Landfill Closure/Remediation Bond Account; and the Solid Waste Fund. In addition to the 10 percent contribution required from the State under the Federal Superfund program, these funds are used to finance site investigations, emergency response actions, design activities, long-term cleanup actions, and operation and maintenance activities at Superfund sites. Currently, nine sites in the State of Maine have been listed as final on the NPL. No new sites have been proposed for listing in 1992.

The Department of Environmental Protection
implements the Superfund Program in the State of Maine

Activities responsible for hazardous waste contamination in the State of Maine include:



Facts about the nine NPL sites in Maine:

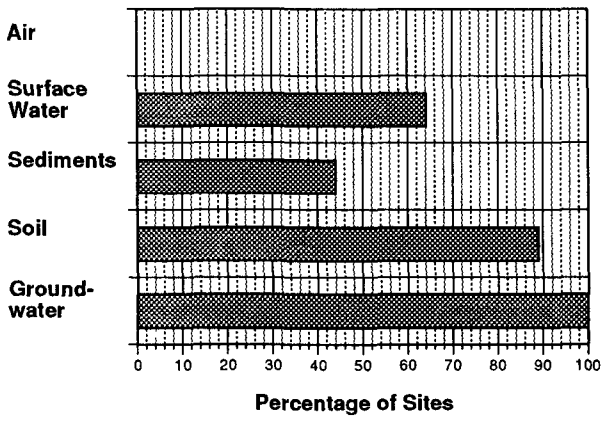
Immediate Actions (such as removing hazardous substances or restricting site access) were performed at eight sites.

Four sites endanger sensitive environments.

Seven sites are located near residential areas.

Most Sites Have Multiple Contaminants and Contaminated Media:

Media Contaminated at Sites



Contaminants Found at Sites

	Percentage of Sites
VOCs	100%
Heavy Metals	78%
PCBs	22%
Dioxin	11%
Creosotes	11%
Acids	11%
Petrochemicals/Explosives	11%
Asbestos	11%

The Potentially Responsible Party Pays...

In the State of Maine, potentially responsible parties are paying for or conducting cleanup activities at four sites.

For Further Information on NPL Sites and Hazardous Waste Programs in the State of Maine Please Contact:

☎	EPA Region 1 Superfund Community Relations Section	For information concerning community involvement	(617) 565-2713
☎	National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎	The Department of Environmental Protection: Bureau of Oil and Hazardous Material Control, Division of Site Investigation and Remediation	For information about the State's responsibility in the Superfund Program	(207) 287-2651
☎	EPA Region 1 Superfund Waste Management Division	For information about the Regional Superfund Program	(617) 573-5707
☎	EPA Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068

THE NPL REPORT

PROGRESS TO DATE

The following Progress Report lists all sites currently on, or deleted from, the NPL and briefly summarizes the status of activities for each site at the time this report was prepared. The steps in the Superfund cleanup process are arrayed across the top of the chart, and each site's progress through these steps is represented by an arrow (⇨) indicating the current stage of cleanup.

Large and complex sites often are organized into several cleanup stages. For example, separate cleanup efforts may be required to address the source of the contamination, hazardous substances in the groundwater, and surface water pollution, or to clean up different areas of a large site. In such cases, the chart portrays cleanup progress at the site's *most advanced* stage, reflecting the status of site activities rather than administrative accomplishments.

⇨ An arrow in the "Initial Response" category indicates that an emergency cleanup, immediate action, or initial action has been completed or currently is underway. Emergency or initial actions are taken as an interim measure to provide immediate relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.

⇨ A final arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site currently is ongoing or planned.

⇨ A final arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy has been selected. In these cases, the arrows are discontinued at the "Remedy Selection" step and resume in the "Construction Complete" category.

⇨ A final arrow at the "Remedial Design" stage indicates that engineers currently are designing the technical specifications for the selected cleanup remedies and technologies.

⇨ A final arrow in the "Cleanup Ongoing" column means that final cleanup actions have been started at the site and currently are underway.

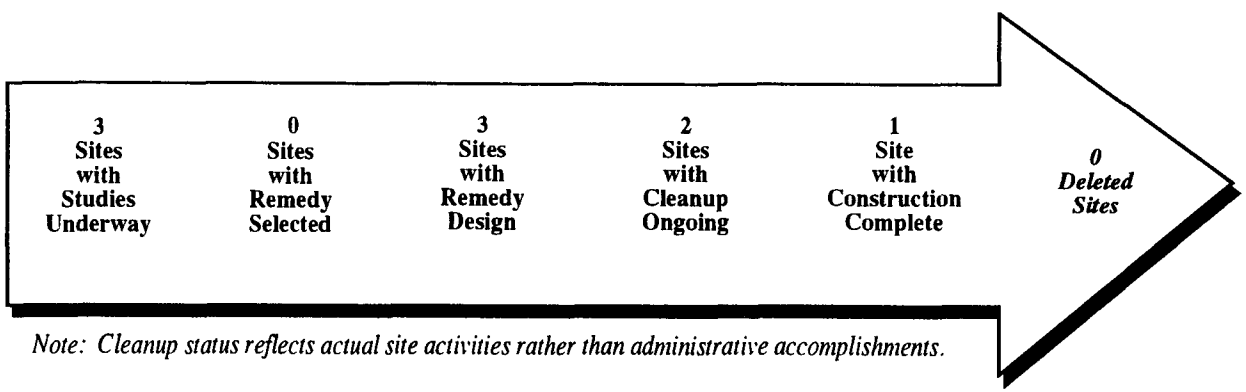
⇨ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and maintenance or monitoring to ensure that the cleanup actions continue to protect human health and the environment.

✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

Progress Toward Cleanup at NPL Sites in the State of Maine

Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
BRUNSWICK NAVAL AIR STATION	CUMBERLAND	Final	07/02/87		⇨					
LORING AIR FORCE BASE	AROOSTOOK	Final	02/21/90	⇨	⇨					
MCKIN COMPANY	CUMBERLAND	Final	09/01/83	⇨	⇨	⇨	⇨	⇨	⇨	
O'CONNOR COMPANY	KENNEBEC	Final	09/08/83	⇨	⇨	⇨	⇨			
PINETTE'S SALVAGE YARD	AROOSTOOK	Final	09/01/83	⇨	⇨	⇨	⇨	⇨		
SACO MUNICIPAL LANDFILL	YORK	Final	02/21/90	⇨	⇨					
SACO TANNERY WASTE PITS	YORK	Final	09/01/83	⇨	⇨	⇨	⇨			
UNION CHEMICAL CO., INC.	KNOX	Final	10/04/89	⇨	⇨	⇨	⇨			
WINTHROP LANDFILL	KENNEBEC	Final	09/01/83	⇨	⇨	⇨	⇨	⇨		

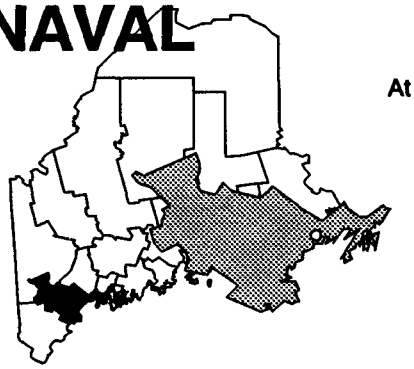


Note: Cleanup status reflects actual site activities rather than administrative accomplishments.

BRUNSWICK NAVAL AIR STATION

MAINE

EPA ID# ME8170022018



EPA REGION 1
Cumberland County
At Routes 24 & 123 in Brunswick

Other Names:
U.S. Navy NAS

Site Description

The Brunswick Naval Air Station is located in the town of Brunswick. Of the 3,092-acre Naval Air Station, 14 areas totalling at least 15 acres have been identified as having been used in the past for the disposal of hazardous wastes. Among the identified site areas, three were used primarily for the landfilling of the station's household, office, and other wastes. Three areas were used for the disposal of various acids, caustics, solvents, and building materials, including asbestos. Three additional areas, including a fire training area, an ammunition dump, and the Defense Reutilization and Marketing Office (DRMO) facility have been added to the investigation. Two areas also were identified as containing asbestos. The various landfills at the site were used from 1945 to 1979. Pesticides, solvents, and waste oils present on the sites could threaten surface water and nearby wetlands. Approximately 3,000 people live on the base within 1/2 mile of the contaminated areas of the site, and nearly 18,000 people served by the groundwater are potentially threatened. The nearest residence is within 1,000 feet of the sites. Area surface water is used for recreation, irrigation, and commercial fishing.

Site Responsibility: The site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/01/84
Final Date: 07/02/87

Threats and Contaminants

The groundwater is contaminated with volatile organic compounds (VOCs) and heavy metals. Soils are contaminated with VOCs, semi-volatile organics, and heavy metals. The on-site surface water is polluted with heavy metals. Accidental ingestion of or direct contact with groundwater, surface water, or soil could pose health hazards to people. The area is restricted to the general public, but base personnel may come in contact with contamination. Harpswell Cove, a wetland adjacent to the site, also is subject to potential contamination.

Cleanup Approach

This site is being addressed in four long-term remedial phases focusing on cleanup of discrete areas of contamination: the Orion Street landfills north and hazardous waste burial area; the eastern plume; sites 2, 4, 5, 6, 7, 9, 11, and 13; and the Perimeter Road landfill.

Response Action Status

Orion Street Landfills North and Hazardous Waste Burial Area: With assistance from the EPA, the extent and nature of contamination has been examined. These studies will be used to help recommend cleanup technologies, which are scheduled to be selected in 1992. The Navy will take the lead on cleanup.

Eastern Plume: A study of the eastern groundwater contamination plume currently is underway to recommend cleanup technologies. Interim cleanup actions are expected to be selected in 1992.

Sites 2, 4, 5, 6, 7, 9, 11, and 13: Investigations are underway to determine the extent of contamination and to pinpoint cleanup approaches for these areas. The studies are expected to be completed in 1993.

Perimeter Road Landfill: A study for this area currently is underway to formulate recommended cleanup technologies, which are scheduled to be selected in 1993.

Site Facts: The Navy and the EPA have agreed on their cleanup responsibilities under an Interagency Agreement (IAG). The IAG later was amended to include the State of Maine as a party to the cleanup. Brunswick Naval Air Station is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate and control the migration of hazardous contaminants at military and other DOD facilities.

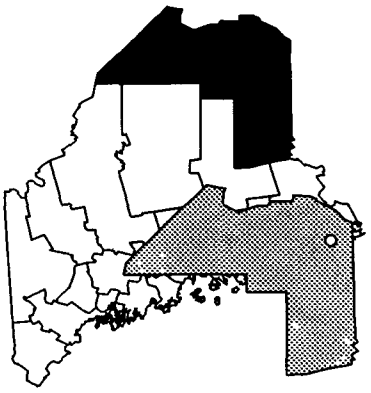
Environmental Progress

After adding this site to the NPL, the EPA assessed conditions at Brunswick Naval Air Station and determined that no immediate actions are necessary to protect the public health or the environment while studies leading to cleanup activities are underway.

Site Repository

Curtis Memorial Library, 23 Pleasant Street, Brunswick, ME 04011

LORING AIR FORCE BASE
MAINE
EPA ID# ME9570024522



EPA REGION 1
Aroostook County
Northeastern Maine

Other Names:
Fire Training Area
US Air Force Loring AFB
Flightline Area

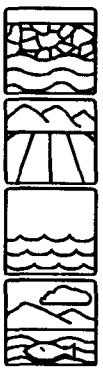
Site Description

The 9,000-acre Loring Air Force Base has operated as an active military installation since 1952. Hazardous wastes generated on the base include waste oils, fuels cleaned from aircraft and vehicles, spent solvents (many of them chlorinated organic chemicals), polychlorinated biphenyls (PCBs), and pesticides. Historically, wastes have been burned or buried in landfills. There are on-site landfills, some of which are old gravel pits. Landfills #2 and #3 were used for disposal of hazardous wastes from 1956 to the early 1980s. In the Fire Department Training Area, large quantities of hazardous materials were landfilled until 1968 and burned until 1974. The 600-acre Flightline and Nose Dock Areas, with their industrial shops and maintenance hangars, were primary generators of hazardous waste on the base; most wastes were disposed of off site, although some probably were disposed of on the ground, on concrete, or in the storm and sewer drains. The site is located in a rural area. The population on the Air Force base within 1 mile of the site is 8,500. A 3,500-foot channelized portion of a tributary to the east Branch of Greenlaw Brook receives storm water runoff from the Flightline Area and the Nose Dock Area, where fuels were handled. An estimated 1,200 people obtain drinking water from wells within 3 miles of hazardous substances on the base; the nearest well is less than 500 feet from where transformers were buried. Surface water within 3 miles downstream of the site is used for recreational activities.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 07/14/89
Final Date: 02/21/90

Threats and Contaminants



Monitoring well tests indicated that the groundwater on the base is contaminated with volatile organic compounds (VOCs) such as methylene chloride, trichloroethylene (TCE), and carbon tetrachloride and heavy metals including barium. Soils in the Flightline and Nose Dock Areas contain significant amounts of fuel, oil, and various VOCs. Surface water and sediment in the Flightline Drainage Ditch are contaminated with VOCs and heavy metals such as iron. People on the base are potentially threatened by direct contact with hazardous substances at the landfills and burn pit because the pit is inadequately fenced. Other potential threats to the public include accidental ingestion of and direct contact with contaminated soils and water. A freshwater wetland is threatened by contamination.

Cleanup Approach

The site is being addressed in six stages: initial actions and five long-term remedial phases focusing on cleanup of the most critical areas, including the nose dock area, the fire training area, the landfills, the flightline drainage ditch, and the remainder of the site.

Response Action Status

Initial Actions: The Air Force removed contaminated soils from the Flightline Drainage Ditch area, as well as tanks near the power plant to reduce the spread of contamination.

Nose Dock Area: The Air Force currently is investigating the nature and extent of contamination in the Nose Dock Area. A decision on cleanup activities is expected in 1994.

Fire Training Area: An additional investigation into the contamination of the fire training area began in 1988. The investigation will define the contaminants and will recommend alternatives for the final cleanup of the area.

Landfills: The Air Force began conducting an investigation of the contamination associated with Landfills #1, #2, and #3 in 1988. The investigation will define the contaminants and will recommend alternatives for the final cleanup scheduled for late 1992.

Flightline Drainage Ditch: An investigation into the contamination in the flightline drainage ditch area began in the late 1980s. The investigation will determine the various contaminants and will recommend alternatives for cleaning up this area.

Remainder of the Site: An investigation into the contamination at 15 additional areas within the site began in 1989. At the conclusion of these studies, the Air Force, in conjunction with the EPA and the State, will recommend the best remedies for the final cleanup of the sites. These areas will be broken into separate cleanup phases as the site studies proceed.

Site Facts: An Interagency agreement was signed in 1991 between the EPA, the Air Force, and the State of Maine. Loring Air Force Base is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities. Loring Air Force Base has been selected for closure in 1994 by the DOD, but the Air Force will continue its program to clean up the hazardous wastes found on the Base.

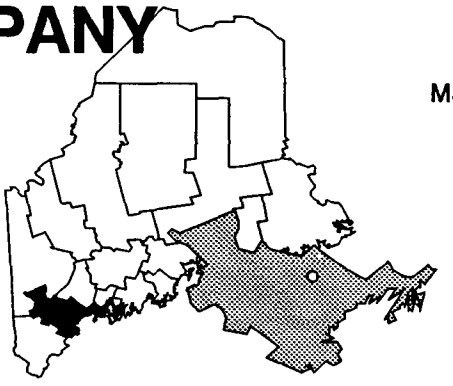
Environmental Progress

Following the listing of this site on the NPL, the EPA completed a site assessment and determined that it presently poses no immediate threat to public health or the environment. Soil and tank removals have been conducted to limit further contamination and maintain site safety while the Air Force is continuing investigations to identify final cleanup actions.

Site Repository

Robert A. Frost Memorial Library, 238 Main Street, Limestone, ME 04750

MCKIN COMPANY
MAINE
EPA ID# MED980524078



EPA REGION 1
Cumberland County
Mayall Road, 1 mile east of the
Town of Gray

Site Description

The McKin Company operated a waste collection, transfer, and disposal facility on a portion of this 7-acre site between 1965 and 1978. The facility is located in a rural residential area about 1 mile east of the center of the Town of Gray. The site formerly was operated as a sand and gravel pit that had been excavated to depths of 6 to 20 feet below the land surface. The operation was constructed for waste generated when a Norwegian tanker ran aground on a ledge in Hussey Sound, spilling 100,000 gallons of industrial fuel. In addition, the plant handled and disposed of a mixture of solvents, oils, and other chemicals. Approximately 100,000 to 200,000 gallons of waste are thought to have been processed annually. Operating facilities included an incinerator, a concrete block building, an asphalt-lined lagoon, and storage and fuel tanks. Wastes also may have been disposed by spreading them over the ground surface. As early as 1973, residents of East Gray reported odors in well water and discoloration of laundry. In 1977, the EPA confirmed that contaminated groundwater had reached many of the local private wells. These water supplies were capped, and the Farmers Home Administration trucked in water supplies. The public water system was extended to the affected area in 1978, and all residents were connected to it. Approximately 300 people live within a 1/2-mile radius of the site. The nearest residence is 300 feet northeast of the property.

Site Responsibility: The site is being addressed through a combination of Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

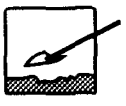
Threats and Contaminants

The groundwater is contaminated with volatile organic compounds (VOCs) including trichloroethane and trichloroethylene (TCE). The soil was contaminated with VOCs, petrochemicals, and heavy metals including arsenic, lead, and mercury. Off-site surface water and groundwater also are contaminated with VOCs. There is no known current exposure of residents to the groundwater, since all residents are connected to the public water supply. Potential threats exist from contaminated groundwater discharges to the surface springs (Boiling Springs) located nearby; however, the ongoing groundwater treatment at the site is addressing this potential threat to Boiling Springs.

Cleanup Approach

The site is being addressed in three stages: initial actions and two long-term remedial phases focusing on soil cleanup and groundwater treatment.

Response Action Status



Initial Actions: In 1979, the State removed 33,500 gallons of wastes and 165 drums of oils and chemicals. From 1985 to 1987, the parties potentially responsible for the site contamination removed 55-gallon drums from the site. A fence surrounding the process area facilities was repaired, and a similar fence was installed across the front of the facility to prevent unauthorized access. Monitoring wells also were installed. Other actions included cleaning the tanks, transporting the empty tanks off site for salvage, and transporting liquids and sludges off site for disposal. The State cleaned and removed all of the remaining aboveground tanks in 1985.

Soil: The remedies selected by the EPA for soil contamination included aeration of the soil and disposal off site of 16 drums. All of the selected cleanup remedies were performed by the potentially responsible parties and were completed in 1987. Thermal soil aeration reduced contaminant levels in 12,000 cubic yards of soils to safe levels.

Groundwater: The remedies selected by the EPA for the cleanup of the groundwater included: (1) installing a groundwater extraction, treatment, and discharge system; (2) groundwater and surface water monitoring to evaluate the effectiveness of the contamination source control and off-site groundwater programs; and (3) closing down the site by demolishing buildings, clearing debris, draining and filling in the lagoon, removing drums and other contaminated materials, fencing the site, and covering the site with soil and vegetation. The cleanup began in 1990 by the potentially responsible parties under EPA oversight. The site closure activities and construction of the treatment system have been completed. Currently, groundwater is being extracted and treated to remove contaminants. Treatment will continue for at least five years, at which time contaminant levels will be reevaluated to determine if established goals have been met. The potentially responsible parties have completed additional studies of an area east of the lagoon, where groundwater contamination was discovered, to determine if the groundwater treatment system needs to be expanded in this area. The studies included geophysical surveys and monitoring well installation. The evaluation of data from these studies is scheduled to be completed in mid-1993.

Site Facts: In 1988, the EPA and the State finalized an agreement with over 320 potentially responsible parties to carry out the cleanup plan.

Environmental Progress

All construction activities at the McKin Company site have been completed. Groundwater treatment will continue until established cleanup goals have been met. Soil contamination levels have been reduced to established cleanup standards.

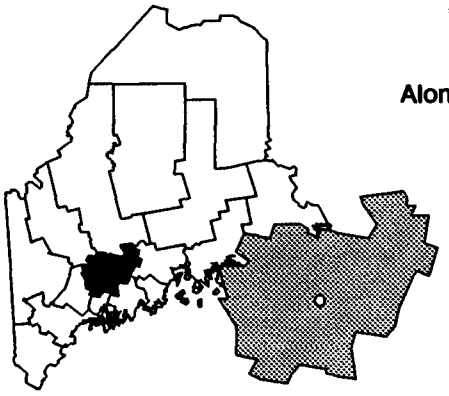
Site Repository

Gray Public Library, 5 Skilling Street, Gray, ME 04039

O'CONNOR COMPANY

MAINE

EPA ID# MED980731475



EPA REGION 1

Kennebec County
Along U.S. Route 17 in Augusta

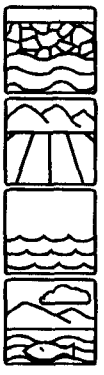
Site Description

The O'Connor Company site occupies approximately 9 acres within a 65-acre area. The site includes a large barn that formerly housed scrap operations, an upland marsh, two lagoons, three former transformer work areas, and a former scrap area where the company stored and discarded rubbish. The site is bordered by private properties and residences, woodlands, a small poultry farm, the west branch of Riggs Brook, and its associated wetlands. In the 1950s, the company began operating a salvage and electrical transformer recycling business at the site. Operations included stripping and recycling transformers containing polychlorinated biphenyl (PCB)-laden oil. In 1972, an oil spill at the site was found to have migrated towards Riggs Brook. Later that year, at the request of the State, the company began containing all transformer fluids found on the site in an aboveground storage tank to prevent future spills. When high levels of PCBs were found in the soils during sampling by the State in 1976, the company was instructed to construct two lagoons to control further migration of oils from the site. The upper lagoon, constructed with a concrete retaining wall and a discharge system, and a lower lagoon, constructed with a horizontal pipe discharge system and an earthen berm, were installed. To reclaim the lagoon areas, the company pumped water from the lagoons into several on-site storage tanks and excavated the lagoon sediments. These sediments were deposited into a low area and were covered by approximately 1 foot of clay soil. This created a barrier for natural surface water drainage from the site to Riggs Brook and resulted in the formation of a marsh behind the on-site barn. Approximately 50 people live within a 1/4-mile radius of the site. The distance from the site to the nearest residence is less than 500 feet.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/30/82
Final Date: 09/08/83

Threats and Contaminants

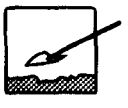


The groundwater on site is contaminated with PCBs and the volatile organic compound, dichlorobenzene. The soil on site is contaminated with PCBs, lead, and various carcinogenic polycyclic aromatic hydrocarbons (PAHs). Standing surface water on the site has been shown to be contaminated with PCBs, aluminum, and lead. People who trespass on the site would be threatened by coming in direct contact with or accidentally ingesting contaminants in soils, sediments, groundwater, or surface water. In addition, eating fish, waterfowl, livestock, or plants that may have become contaminated would pose a threat to people. The site currently is surrounded by a chain-link fence and is posted with appropriate warning signs.

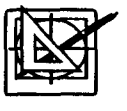
Cleanup Approach

The site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Immediate Actions: The O'Connor Company constructed a fence around the property and posted warning signs along approximately 5 acres of the site in 1984. The owner also sampled and analyzed the contents of all drums and storage tanks on the site and removed them. In 1987, Central Maine Power extended the fence to areas where additional contamination was found and removed additional contaminated material from the site.



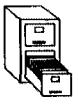
Entire Site: The remedies selected by the EPA to be performed by the parties potentially responsible for the site contamination include pumping 150,000 to 195,000 gallons of surface water from the upper and lower lagoons and marsh and removing it to an EPA-approved off-site treatment facility, and treating 23,500 cubic yards of contaminated soils and sediments using solvents to extract contaminants. The contaminated liquid from this process will be incinerated off site. The residues that contain high levels of lead will be treated by solidifying the material and removing it. The site will be restored by backfilling, and the potentially responsible parties will establish wetlands to replace those lost. Groundwater will be collected, filtered, and treated to contain or remove the contaminants. The potentially responsible parties are conducting the design activities, which involve treatability studies and aquifer testing. The actual cleanup is will begin when the design activities are completed, expected in late 1994.

Site Facts: In 1984, the EPA issued an Administrative Order to the O'Connor Company, requiring construction of a fence, posting of warning signs, and analysis of the contents of all drums and storage tanks found on the site. In 1986, the EPA issued an Administrative Order to the company and Central Maine Power to conduct an investigation into the type and extent of contamination at the site and to identify alternatives for site cleanup. In 1986, the State also issued Orders to the potentially responsible parties, requiring the removal of the hazardous substances present in tanks and containers at the site. In 1987, the EPA and the State issued a joint Administrative Order to O'Connor and Central Maine Power to investigate the nature and extent of contamination and to identify alternatives for cleanup, also to extend the existing 5-acre fence to cover an additional 4 acres. In 1990, the EPA and Central Maine Power signed a Consent Decree for the design of the cleanup and the cleanup itself.

Environmental Progress

The construction of a fence that limits access to the contaminated areas of the site and the removal of drums and storage tanks have reduced the exposure potential at the O'Connor Company site. The implementation of the cleanup remedies selected by the EPA will further reduce site contamination, making the site safer as cleanup actions progress.

Site Repository

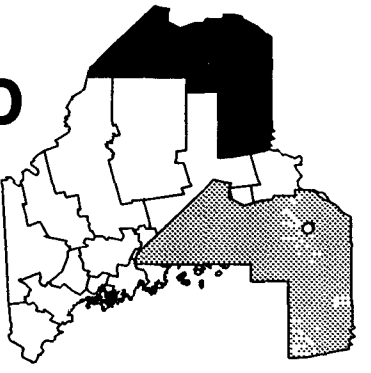


Lithgow Public Library, Winthrop Street, Augusta, ME 04330

PINETTE'S SALVAGE YARD

MAINE

EPA ID# MED980732291



EPA REGION 1
Aroostook County
1 mile southwest of Washburn

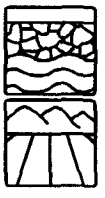
Site Description

Pinette's Salvage Yard covers 12 acres and consists of a vehicle repair and salvage yard. In 1979, three electrical transformers were removed from Loring Air Force Base by a private electrical contractor and brought to the site, where they ruptured while being moved from the delivery vehicle. Approximately 900 to 1,000 gallons of dielectrical fluids containing polychlorinated biphenyls (PCBs) spilled directly onto the ground. The oil migrated through the soil and may have contaminated groundwater and surface water. Land surrounding the yard is used for residential, general industrial, and agricultural purposes. The nearest population center is located approximately 1 mile northeast of the site. There are approximately 15 people living within a 1/2-mile radius of the site. The distance to the nearest residence is about 250 feet from the spill area. An undeveloped forest and wetlands area also is adjacent to the site. The Aroostook River, a major waterway in Northern Maine, is located approximately 1,500 feet from the site. The water supply for the eight to ten residences located within a 1/2-mile radius is obtained from private wells located in the deep bedrock aquifer below the site. Municipal wells, used to supply the drinking water to local residents, are located a mile from the site.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

Threats and Contaminants



The on-site groundwater and soil are contaminated with PCBs and volatile organic compounds (VOCs) including benzene and chloromethane. People who accidentally ingest or come in direct contact with the soil may be exposed to contaminants. Inhalation of contaminated dusts released from the site also is a threat. Current use of groundwater does not pose a threat because the wells are located upgradient of the site.

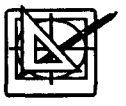
Cleanup Approach

The site is being addressed in three stages: emergency actions and two long-term remedial phases focusing on the source control and groundwater cleanup.

Response Action Status

Emergency Actions: In 1983, the EPA excavated 800 cubic yards of PCB-contaminated soil and transported it to an approved disposal facility.

Source Control: The remedy selected by the EPA to control the source of contamination at the site includes off-site incineration of PCB-contaminated soil and on-site solvent extraction of an additional 1,700 to 1,900 cubic yards of contaminated soil. During the first year of cleanup activities in 1991, 410 cubic yards of highly contaminated soil were excavated and incinerated off-site. The cleanup is underway and is expected to be completed in late 1992.



Groundwater: The remedy selected by the EPA to clean up groundwater includes installation of a groundwater collection system, and treatment of the groundwater by first pumping it through a granular filter to remove the contaminants, followed by carbon adsorption to remove the organic contaminants. The EPA is preparing the technical specifications and design for the cleanup. Preparations included residential well sampling, which was conducted in 1990 and 1991. Cleanup activities are expected to begin in early 1993 once the design activities and source control cleanup are completed.

Environmental Progress

Removal and treatment of PCB-contaminated soil has reduced the potential of exposure to hazardous substances at the site, making the Pinette's Salvage Yard area safer while additional cleanup activities are underway.

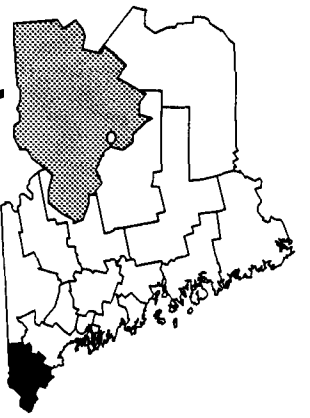
Site Repository

Washburn Town Office, Main Street, Washburn, ME 04286

SACO MUNICIPAL LANDFILL

MAINE

EPA ID# MED980504393



EPA REGION 1
York County
Saco

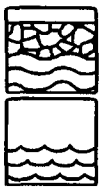
Site Description

The Saco Municipal Landfill covers approximately 90 acres and has been owned and operated by the City of Saco since 1960. The site consists of four distinct disposal areas. Area 1 is a closed and capped municipal dump that was used for open burning of household and industrial waste; Area 2 is an inactive industrial dump that accepted bulk and demolition debris; Area 3 is a relatively small area of about 1 acre in which wastes such as tires and leather and rubber scraps from local industries were dumped. This uncovered area is located on the outside of the service road that circles Area 4. Area 4 is a recently closed landfill that accepted household waste and tannery sludge containing chromium and other heavy metals, as well as volatile organic compounds (VOCs). The sludge was placed in unlined trenches, often directly in contact with groundwater. Area 2 has a leachate collection system, but there is no evidence of liners or leachate systems in other disposal areas. The population within a 3-mile radius is 32,000. Approximately 130 people live within a mile of the site. Water and sediment in Sandy Brook, which flows through the site, and groundwater beneath the site have shown elevated levels of various metals and organics. Approximately 700 people obtain drinking water from wells within 3 miles of the landfill. In 1975, the Biddeford and Saco Water Company extended water lines along Jenkins Road and Route 112.

Site Responsibility: The site is being addressed through Federal, State, and municipal actions.

NPL LISTING HISTORY
Proposed Date: 06/15/88
Final Date: 02/21/90

Threats and Contaminants



Wastes produced by local industries may be the source of contaminants in the groundwater, surface water, and sediments in the Saco Landfill site. Industries in the area produce leather goods, plastics, vinyl stripping, machine parts, textiles, foam products, and finishes. Typical wastes from these industries include heavy metals, chromium, solvents, dyes, polymers, and phthalates. The groundwater contains elevated levels of heavy metals including iron, manganese, and toluene. Sandy Brook has been shown to be contaminated with elevated levels of heavy metals and VOCs. The site is only partially fenced, making it possible for people and animals to come into direct contact with hazardous substances. People who come in direct contact with or accidentally ingest contaminated groundwater, surface water, or sediments may be at risk. Surface waters in Sandy Brook also can transport contamination off site.

Cleanup Approach

The site is being addressed in two stages: initial actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

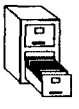
Initial Actions: The City of Saco, in conjunction with the Maine Department of Environmental Protection (MEDEP) and the EPA, began procedures to remove and dispose of the wastes from Area 3 in mid-1991. These wastes are not hazardous and include leather and rubber scraps from local industry. MEDEP is overseeing removal to ensure that no hazardous substances are discovered or disposed of.

Entire Site: The parties potentially responsible for contamination at the site will conduct an investigation into the nature and extent of the contamination. The investigation will also recommend alternatives for the final cleanup. The investigation is planned to start in 1994.

Environmental Progress

The EPA assessed conditions at the Saco Municipal Landfill and determined that the actions currently being taken are sufficient to ensure that immediate threats to human health and the environment are controlled. Some intermediate actions may be deemed necessary while awaiting the results of the investigation for the final cleanup alternatives.

Site Repository

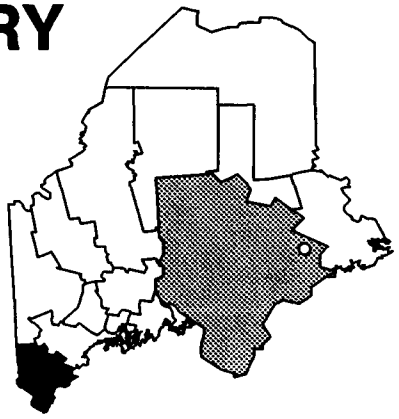


City Hall, 300 Main Street, Saco, ME 04072

SACO TANNERY WASTE PITS

MAINE

EPA ID# MED980520241



EPA REGION 1
York County
Saco

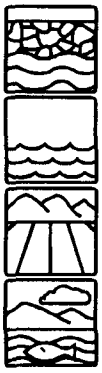
Site Description

The Saco Tannery Waste Pits site covers 233 acres and was operated from 1959 until 1981, when the Saco Tannery Corporation filed for bankruptcy and stopped site operations. The site was used as a disposal area for process wastes such as chromium sludges, acid wastes, methylene chloride, and caustic substances. More than 23 million gallons of wastes were deposited in two lagoons and 53 disposal pits. Several types of wastes were deposited in Chromium Lagoon 1 until 1968. Waste streams were separated, and Chromium Lagoon 2 was constructed in 1969 only for chromium and solid wastes. Smaller pits were constructed for acid wastes from the grease-rendering fleshing process and for caustic wastes from the patent leather process. The site is bordered by the Maine Turnpike, Flag Pond Road, residential property on Hearn Road, and the Scarborough town line. Access to the site is controlled by a fence along the Maine Turnpike and Flag Pond Road, with a locking gate at the entrance on Flag Pond Road. Groundwater is the source of drinking water for residents located south and west of the site. Approximately 20 residences are located within 1,000 feet of the site and 2,600 people live within a 3-mile radius of the site. Because the area is heavily wooded and is inhabited by a variety of wildlife, it is frequently used by hunters. The site is also used by snowmobilers in the winter.

Site Responsibility: This site is being addressed through Federal and State actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

Threats and Contaminants



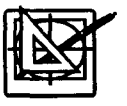
Groundwater is contaminated with heavy metals including chromium, arsenic and lead. Sediments are contaminated with antimony and heavy metals. The soil is contaminated with antimony, volatile organic compounds (VOCs), and heavy metals. Trespassers who come in direct contact with or accidentally ingest contaminated groundwater, soil, or sediment may be at risk. The surrounding wildlife may be at risk from the contamination, as well as the wetlands, which cover a large portion of the site.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: In 1983, the EPA removed corrosive liquid from three acid pits and disposed of it at an approved facility. The EPA also neutralized the remaining sludge in the three pits with lime, covered them with caps, and erected a fence across the access road to the property.



Entire Site: The EPA and the State of Maine conducted studies into the contamination at the site. The preferred remedy for site cleanup includes: covering waste in disposal pits and lagoons with geotextile fabrics and 4 to 6 feet of soil; monitoring the groundwater to detect any continued contamination; and designating the area as a permanent conservation zone to be protected by the State of Maine. Treatment alternatives for the waste materials will be used should contamination continue to affect groundwater. Institutional controls to limit the use of land and groundwater were put into effect in late 1991. Treatment alternatives for the waste materials were not considered necessary at that point in time. The cleanup design is scheduled to be completed in late 1992.

Environmental Progress

The removal of liquid wastes, the neutralization of sludges, the capping of three pits, and institutional controls have greatly reduced the potential of exposure to hazardous substances surrounding the acid pit areas, and protected the public health and the environment. The Saco Tannery site does not pose an immediate threat while further cleanup activities are planned.

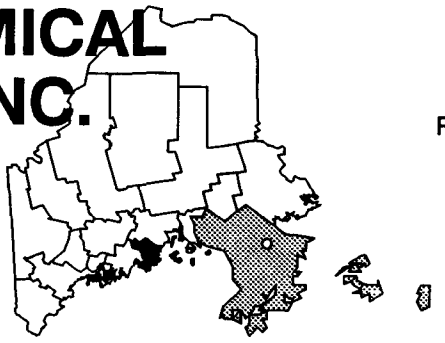
Site Repository

Dyer Library, 371 Main Street, Saco, ME 04072

UNION CHEMICAL COMPANY, INC.

MAINE

EPA ID# MED042143883



EPA REGION 1

Knox County
Along the south side of
Route 17, west of South Hope

Site Description

The Union Chemical Company, Inc. site is located on approximately 12 acres and began operations in 1967 as a formulator of paint and coating strippers. In 1969, the company expanded its operations and began handling and recovering petrochemical-based solvents. In 1979, as part of the recovery process, the company added a fluidized bed incinerator to burn contaminated sludges, still bottoms, and other undetermined hazardous wastes. Some of these types of waste were burned in an on-site boiler that provided heat and operating power to the facility. Between 1979 and 1984, the plant was cited by the State for deficiencies or violations of several operating licenses. The State closed the waste treatment operations in 1984, at which time approximately 2,000 drums and 30 liquid storage tanks containing hazardous waste were stored on the site. The on-site soil and groundwater contamination resulted from improper handling and operating practices such as leaking stored drums, spills, use of a septic tank and a leachfield for disposal of process wastewater, and could also be attributed to past disposal methods. There are approximately 200 people living within a 1/2-mile radius of the site. These residents depend on groundwater for domestic use. The site is bounded by Quiggle Brook and is partially in the 100-year flood plain. Grassy Pond is less than a mile east of the site and is an alternate drinking water source serving approximately 22,800 people in the towns of Camden, Rockport, Rockland, and Thomaston.

Site Responsibility: The site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 04/01/85
Final Date: 10/04/89

Threats and Contaminants

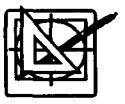
Buildings and other plant facilities contain heavy metals, dioxins, and asbestos. Approximately 2 1/2 acres of the site are fenced and contain the former processing buildings, two aboveground storage tanks, a former drum storage area, and incinerator facilities. The on-site groundwater and soils are contaminated with volatile organic compounds (VOCs) including toluene, xylenes and others. Off-site surface water contamination has occurred through discharges of contaminated process wastewater into the adjacent Quiggle Brook and possibly through natural discharge of contaminated groundwater into the brook. People who come into direct contact with or accidentally ingest contaminated groundwater could be at risk.

Cleanup Approach

The site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: In 1984, the State and the EPA collectively removed all surface drums, over 100,000 gallons of liquid wastes and sludges from aboveground storage tanks, and some contaminated soil from the site.



Entire Site: Based on investigations of the site, the EPA selected the following remedies in 1990: soil excavation and on-site low-temperature soil aeration treatment; vacuum-enhanced groundwater extraction, on-site groundwater treatment, and on-site discharge of treated groundwater into Quiggle Brook; facilities decontamination and demolition, and off-site disposal of debris; and further monitoring and analysis of off-site soils to determine whether contamination is present as a result of past Union Chemical Company, Inc. operations. Throughout all phases of the data collection and analysis effort, the EPA will determine if additional cleanup actions are required. The design for these remedies began in late 1991 and is scheduled to be completed in early 1994.

Site Facts: In 1987 and 1988, the EPA, the State, and 288 parties potentially responsible for contamination at the site entered into two Administrative Orders. In these Orders, the parties agreed to conduct an investigation to examine the possible cleanup alternatives and have reimbursed the EPA and the State for approximately 80 percent of past cleanup costs. In 1989, the EPA entered into a Consent Decree with nine additional potentially responsible parties where the parties agreed to reimburse the EPA for additional incurred past costs and certain litigation costs. In 1991, the EPA entered into a Consent Decree with the past owner/operator for reimbursement of additional EPA past costs and for a Resource Conservation and Recovery Act (RCRA) Administrative Order violation from 1987. Also in 1991, the EPA filed three separate Consent Decrees with three potentially responsible parties for violations. A Consent Decree between EPA, the State and 60 potentially responsible parties was issued in 1991 formalizing an agreement for the parties to support site cleanup. In January 1992, EPA, the State and 270 potentially responsible parties formalized a settlement agreement.

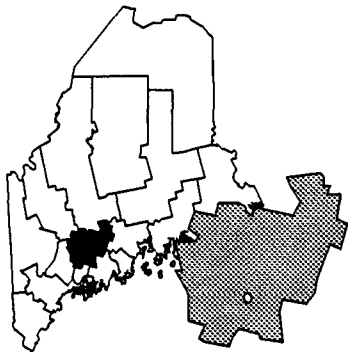
Environmental Progress

The removal of contaminated drums, tanks, and soil has reduced the potential for exposure to contamination at the Union Chemical Company, Inc. site while it awaits implementation of the final cleanup remedies selected by the EPA.

Site Repository 

Hope Town Office, Route 105, Hope, ME 04847

WINTHROP LANDFILL
MAINE
EPA ID# MED980504435



EPA REGION 1
Kennebec County
Winthrop

Site Description

The Winthrop Landfill is a 13-acre site located along the western shore of Lake Annabessacook and consists of two adjacent properties, the Winthrop Town Landfill and the privately owned Savage Landfill. The site initially was used in the 1920s as a sand and gravel pit. In the 1930s, parts of the site received municipal, commercial, and industrial wastes. The site accepted hazardous substances between the early 1950s and mid-1970s. It is estimated that over 3 million gallons of chemical wastes, mostly complex organic compounds including resins, plasticizers, solvents, and other process chemicals, were disposed of at the site. Late in 1979, the town attempted to expand the landfill, but this revealed numerous rusting and leaking barrels. The town decided to close the landfill and construct a transfer station on the site. The Savage Landfill contracted to accept municipal solid waste and debris from two small neighboring towns and also accepted wastes from Winthrop to extend the life of the town landfill. Wastes were openly burned until 1972, and landfilling occurred from 1972 until 1982. There are 63 residences within 1/2 mile of the site. Wetlands are located near the site, and Lake Annabessacook is used for recreational purposes.

Site Responsibility: The site is being addressed through Federal, municipal, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 10/01/81
Final Date: 09/01/83

Threats and Contaminants

Volatile organic compounds (VOCs) from the landfill were found to be migrating off site in the groundwater. The soil has been contaminated from drums containing inorganic and organic chemicals and municipal wastes. Potential risks exist if contaminated soil or groundwater is accidentally ingested. The area is fenced to protect against direct contact with contamination. Wetlands located near the site are potentially at risk from site contamination.

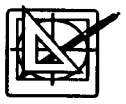
Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the entire site and groundwater treatment.

Response Action Status

Immediate Actions: The potentially responsible parties and the Town of Winthrop have extended the town water supply to residents previously on well water drawn from a contaminated aquifer below the landfill.

Entire Site: An impermeable clay cover has been constructed over the landfill to contain the landfilled wastes, thereby reducing the quantity of contaminated leachate entering the groundwater. A fence has been placed around the landfill to protect against direct contact with the site, and deed restrictions have been imposed prohibiting use of the landfill for activities other than the cleanup actions and prohibiting excavation in the area of the landfill. Cleanup activities are scheduled for completion in 1992. Long-term monitoring of groundwater, surface water, and sediments is ongoing on a quarterly basis.



Groundwater and Surface Water Treatment: Engineering design work consisting of geologic, hydrogeologic, and treatment alternatives studies was conducted by the potentially responsible parties. The studies provided data supporting the need to construct a treatment system. The studies were completed in early 1992. The parties potentially responsible for the contamination will install an extraction system to treat and eliminate groundwater and surface water contamination if cleanup criteria are exceeded. The EPA and the state of Maine will make a decision regarding the necessity of such an extraction system by late 1992.

Site Facts: A Consent Decree ordering the above actions was signed by the EPA and the potentially responsible parties and filed with the U.S. District Court in 1986.

Environmental Progress

The provision of an alternative water supply to affected residences in the area of the Winthrop Landfill and the installation of a fence to restrict site access have eliminated the threat of direct contact with contaminants at the site while it awaits further cleanup activities.

Site Repository

Charles M. Baily Public Library, Bowdin Street, Winthrop, ME 04364

GLOSSARY

Terms Used in the NPL Book

This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context. A table of common toxic chemicals found at NPL sites, their sources, and their potential threats is located on page G-15

Acids: Substances, characterized by low pH (less than 7.0), that are used in chemical manufacturing. Acids in high concentration can be very corrosive and react with many inorganic and organic substances. These reactions possibly may create toxic compounds or release heavy metal contaminants that remain in the environment long after the acid is neutralized.

Administrative Order On Consent: A legal and enforceable agreement between the EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties (PRPs) agree to perform or pay for site studies or cleanups. It also describes the oversight rules, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. This Order is signed by PRPs and the government; it does not require approval by a judge.

Administrative Order [Unilateral]: A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies). This type of Order is not signed by the PRPs and does not require approval by a judge.

Aeration: A process that promotes breakdown of contaminants in soil or water by exposing them to air.

Agency for Toxic Substances and Disease Registry (ATSDR): The Federal agency within the U.S. Public Health Service charged with carrying out the health-related responsibilities of CERCLA.

Air Stripping: A process whereby volatile organic chemicals (VOCs) are removed from contaminated material by forcing a stream of air through the contaminated material in a pressurized vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

Ambient Air: Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the vicinity of contaminated air sources.

Applicable or Relevant and Appropriate Requirements (ARARs): Federal, State, or local laws which apply to Superfund activities at NPL sites. Both emergency and long-term actions must comply with these laws or provide sound reasons for allowing a waiver. ARARs must be identified for each site relative to the characteristics of the site, the substances found at the site, or the cleanup alternatives being considered for the site.

GLOSSARY

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called groundwater. A "sole source aquifer" supplies 50 percent or more of the drinking water of an area.

Artesian (Well): A well made by drilling into the earth until water is reached, which, due to internal pressure, flows up like a fountain.

Asbestos: A mineral fiber that can pollute air or water and is known to cause cancer or asbestosis when inhaled.

Attenuation: The naturally occurring process by which a compound is reduced in concentration over time through adsorption, degradation, dilution, or transformation.

Background Level: The amount of a substance typically found in the air, water, or soil from natural, as opposed to human, sources.

Baghouse Dust: Dust accumulated in removing particulates from the air by passing it through cloth bags in an enclosure.

Bases: Substances characterized by high pH (greater than 7.0), which tend to be corrosive in chemical reactions. When bases are mixed with acids, they neutralize each other, forming salts.

Berm: A ledge, wall, or a mound of earth used to prevent the migration of contaminants.

Bioaccumulate: The process by which some contaminants or toxic chemicals gradually collect and increase in concentration in living tissue, such as in plants, fish, or people, as they breathe contaminated air, drink contaminated water, or eat contaminated food.

Biological Treatment: The use of bacteria or other microbial organisms to break down toxic organic materials into carbon dioxide and water.

Bioremediation: A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants and break them down into non-hazardous components.

Bog: A type of wetland that is covered with peat moss deposits. Bogs depend primarily on moisture from the air for their water source, are usually acidic, and are rich in plant residue [see Wetland].

Boom: A floating device used to contain oil floating on a body of water or to restrict the potential overflow of waste liquids from containment structures.

Borehole: A hole that is drilled into the ground and used to sample soil or ground-water.

Borrow Pit: An excavated area where soil, sand, or gravel has been dug up for use elsewhere.

Cap: A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap generally is mounded or sloped so water will drain off.

Carbon Adsorption: A treatment system in which contaminants are removed from groundwater and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

Carbon Disulfide: A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic

properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

Carbon Treatment: [see Carbon Adsorption].

Cell: In solid waste disposal, one of a series of holes in a landfill where waste is dumped, compacted, and covered with layers of dirt.

CERCLA: [see Comprehensive Environmental Response, Compensation, and Liability Act].

Characterization: The sampling, monitoring, and analysis of a site to determine the extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Chemical Fixation: The use of chemicals to bind contaminants, thereby reducing the potential for leaching or other movement.

Chromated Copper Arsenate: An insecticide/herbicide formed from salts of three toxic metals: copper, chromium, and arsenic. This salt is used extensively as a wood preservative in pressure-treating operations. It is highly toxic and water-soluble, making it a relatively mobile contaminant in the environment.

Cleanup: Actions taken to eliminate a release or threat of release of a hazardous substance. The term "cleanup" sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Closure: The process by which a landfill stops accepting wastes and is shut down under Federal guidelines that ensure the protection of the public and the environment.

Comment Period: A specific interval during which the public can review and comment on various documents and EPA actions related to site cleanup. For example, a comment period is provided when the EPA proposes to add sites to the NPL. Also, there is minimum 3-week comment period for community members to review and comment on the remedy proposed to clean up a site.

Community Relations: The EPA effort to establish and maintain two-way communication with the public. The goals of community relations programs include creating an understanding of EPA programs and related actions, assuring public input into decision-making processes related to affected communities, and making certain that the Agency is aware of, and responsive to, public concerns. Specific community relations activities are required in relation to Superfund cleanup actions [see Comment Period].

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Congress enacted the CERCLA, known as Superfund, in 1980 to respond directly to hazardous waste problems that may pose a threat to the public health and the environment. The EPA administers the Superfund program.

Confluence: The place where two bodies of water, such as streams or rivers, come together.

Confined Aquifer: An aquifer in which groundwater is confined under pressure that is significantly greater than atmospheric pressure.

Consent Decree: A legal document, approved and issued by a judge, formalizing an agreement between the EPA and the parties potentially responsible for site contamination. The decree describes cleanup actions that the potentially responsible parties are required to perform, or the costs incurred by the government that the parties will reimburse, and the roles, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. If a settlement between the EPA and a potentially responsible party includes cleanup actions, it must be in the form of a Consent Decree. A Consent Decree is subject to a public comment period.

Consent Order: [see Administrative Order on Consent].

Containment: The process of enclosing or containing hazardous substances in a structure, typically in a pond or a lagoon, to prevent the migration of contaminants into the environment.

Contaminant: Any physical, chemical, biological, or radiological material or substance whose quantity, location, or nature produces undesirable health or environmental effects.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials into the environment.

Cooperative Agreement: A contract between the EPA and the States, wherein a State agrees to manage or monitor certain site cleanup responsibilities and other activities on a cost-sharing basis.

Cost Recovery: A legal process by which potentially responsible parties can be required to pay back the Superfund program for money it spends on any cleanup actions [see Potentially Responsible Parties].

Cover: Vegetation or other material placed over a landfill or other waste material. It can be designed to reduce movement of water into the waste and to prevent erosion that could cause the movement of contaminants.

Creosotes: Chemicals used in wood preserving operations and produced by distillation of tar, including polycyclic aromatic hydrocarbons and polynuclear aromatic hydrocarbons [see PAHs and PNAs]. Contaminating sediments, soils, and surface water, creosotes may cause skin ulcerations and cancer through prolonged exposure.

Culvert: A pipe used for drainage under a road, railroad track, path, or through an embankment.

Decommission: To revoke a license to operate and take out of service.

Degradation: The process by which a chemical is reduced to a less complex form.

Degrease: To remove grease from wastes, soils, or chemicals, usually using solvents.

Deletion: A site is eligible for deletion from the NPL when Superfund response actions at the site are complete. A site is deleted from the NPL when a notice is published in the Federal Register.

De minimis: This legal phrase pertains to settlements with parties who contributed small amounts of hazardous waste to a site. This process allows the EPA to settle with small, or *de minimis* contributors, as a single group rather than as individuals, saving time, money, and effort.

Dewater: To remove water from wastes, soils, or chemicals.

Dike: A low wall that can act as a barrier to prevent a spill from spreading.

Dioxin: An organic chemical by-product of pesticide manufacture which is known to be one of the most toxic man-made chemicals.

Disposal: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or incineration.

Downgradient: A downward hydrologic slope that causes groundwater to move toward lower elevations. Therefore, wells *downgradient* of a contaminated groundwater source are prone to receiving pollutants.

Ecological Assessment: A study of the impact of man-made or natural activity on living creatures and their environment.

Effluent: Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Emission: Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

Emulsifiers: Substances that help in mixing materials that do not normally mix; e.g., oil and water.

Endangerment Assessment: A study conducted to determine the risks posed to public health or the environment by contamination at NPL sites. The EPA or the State conducts the study when a legal action is to be taken to direct the potentially responsible parties to clean up a site or pay for the cleanup. An endangerment assessment supplements an investigation of the site hazards.

Enforcement: EPA, State, or local legal actions taken against parties to facilitate settlements; to compel compliance with laws, rules, regulations, or agreements; or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or surface runoff, but can be intensified by such land-related practices as farming, residential or industrial development, road building, or timber-cutting. Erosion may spread surface contamination to offsite locations.

Estuary (estuarine): Areas where fresh water from rivers and salt water from nearshore ocean waters are mixed. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These water ecosystems shelter and feed marine life, birds, and wildlife.

Evaporation Ponds: Areas where sewage sludge or other watery wastes are dumped and allowed to dry out.

Feasibility Study: The analysis of the *potential cleanup alternatives for a site.* The feasibility study usually starts as soon as the remedial investigation is underway. In this volume, the feasibility study is referred to as a site study [see also Remedial Investigation].

Filtration: A treatment process for removing solid (particulate) matter from water by passing the water through sand, activated carbon, or a man-made filter. The process is often used to remove particles that contain contaminants.

Flood Plain: An area along a river, formed from sediment deposited by floods. Flood plains periodically are innundated by natural floods, which can spread contamination.

Flue Gas: The air that is emitted from a chimney after combustion in the burner occurs. The gas can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles, and many chemical pollutants.

Fly Ash: Non-combustible residue that results from the combustion of flue gases. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, as well as many other chemical pollutants.

French Drain System: A crushed rock drain system constructed of perforated pipes, which is used to drain and disperse wastewater.

Gasification (coal): The conversion of soft coal into gas for use as a fuel.

General Notice Letter: [See Notice Letter].

Generator: A facility that emits pollutants into the air or releases hazardous wastes into water or soil.

Good Faith Offer: A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications and willingness to perform a site study or cleanup.

Groundwater: Water that fills pores in soils or openings in rocks to the point of saturation. In aquifers, groundwater occurs in sufficient quantities for use as drinking and irrigation water and other purposes.

Groundwater Quality Assessment: The process of analyzing the chemical characteristics of groundwater to determine whether any hazardous materials exist.

Halogens: Reactive non-metals, such as chlorine and bromine. Halogens are very good oxidizing agents and, therefore, have many industrial uses. They are rarely found by themselves; however, many chemicals such as polychlorinated biphenyls (PCBs), some volatile organic compounds (VOCs), and dioxin are reactive because of the presence of halogens.

Hazard Ranking System (HRS): The principal screening tool used by the EPA to evaluate relative risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater and on other factors such as nearby population. The HRS score is the primary factor in deciding if the site should be on the NPL.

Hazardous Waste: By-products of society that can pose a substantial present or potential hazard to human health and the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Heavy Metals: Metallic elements with high atomic weights, such as arsenic, lead, mercury, and cadmium. Heavy metals are very hazardous even at low concentrations and tend to accumulate in the food chain.

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hot Spot: An area or vicinity of a site containing exceptionally high levels of contamination.

Hydrocarbons: Chemical compounds that consist entirely of hydrogen and carbon.

Hydrology: The properties, distribution, and circulation of water.

Hydrogeology: The geology of groundwater, with particular emphasis on the chemistry and movement of water.

Impoundment: A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Incineration: A group of treatment technologies involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to reduce the remaining residues to a non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

Infiltration: The movement of water or other liquid down through soil from precipitation (rain or snow) or from application of wastewater to the land surface.

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Injection Well: A well into which waste fluids are placed, under pressure, for purposes of disposal.

Inorganic Chemicals: Chemical substances of mineral origin, not of basic carbon structure.

Installation Restoration Program: The specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its hazardous waste sites and controlling the migration of hazardous contaminants from those sites.

Intake: The source from where a water supply is drawn, such as from a river or water body.

Interagency Agreement: A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities, setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

Interim (Permit) Status: Conditions under which hazardous waste treatment, storage, and disposal facilities, that were operating when regulations under the RCRA became final in 1980, are temporarily allowed by the EPA to continue to operate while awaiting denial or issuance of a permanent permit. The facility must comply with certain regulations to maintain interim status.

Lagoon: A shallow pond or liquid waste containment structure. Lagoons typically are used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Landfarm: To apply waste to land or incorporate waste into the surface soil, such as fertilizer or soil conditioner. This practice commonly is used for disposal of composted wastes and sludges.

Landfill: A disposal facility where waste is placed in or on land. *Sanitary* landfills are disposal sites for non-hazardous solid wastes. The waste is spread in layers, compacted to the smallest practical volume, and covered with soil at the end of each operating day. Secure *chemical* landfills are disposal sites for hazardous waste. They are designed to minimize the chance of release of hazardous substances into the environment [see Resource Conservation and Recovery Act].

Leach, Leaching [v.t.]: The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste.

Leachate Collection System: A system that gathers liquid that has leaked into a landfill or other waste disposal area and pumps it to the surface for treatment.

Liner: A relatively impermeable barrier designed to prevent leachate (waste residue) from leaking from a landfill. Liner materials include plastic and dense clay.

Long-term Remedial Phase: Distinct, often incremental, steps that are taken to solve site pollution problems. Depending on the complexity, site cleanup activities can be separated into several of these phases.

Long-term Response Action: An action which requires a continuous period of on-site activity before cleanup goals are achieved. These actions typically include the extraction and treatment of groundwater and monitoring actions.

Marsh: A type of wetland that does not contain peat moss deposits and is dominated by vegetation. Marshes may be either fresh or saltwater and tidal or non-tidal [see Wetland].

Migration: The movement of oil, gas, contaminants, water, or other liquids through porous and permeable soils or rock.

Mill Tailings: [See Mine Tailings].

Mine Tailings: A fine, sandy residue left from mining operations. Tailings often contain high concentrations of lead, uranium, and arsenic or other heavy metals.

Mitigation: Actions taken to improve site conditions by limiting, reducing, or controlling toxicity and contamination sources.

Modeling: A technique using a mathematical or physical representation of a system or theory that tests the effects that changes on system components have on the overall performance of the system.

Monitoring Wells: Special wells drilled at specific locations within, or surrounding, a hazardous waste site where groundwater can be sampled at selected depths and studied to obtain such information as the direction in which groundwater flows and the types and amounts of contaminates present.

National Priorities List (NPL): The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The EPA is required to update the NPL at least once a year.

Natural Attenuation: [See Attenuation].

Neutrals: Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Water is the most commonly known neutral, however, naphthalene, pyrene, and trichlorobenzene also are examples of neutrals.

Nitroaromatics: Common components of explosive materials, which will explode if activated by very high temperatures or pressures; 2,4,6-Trinitrotoluene (TNT) is a nitroaromatic.

Notice Letter: A General Notice Letter notifies the parties potentially responsible for site contamination of their possible liability. A Special Notice Letter begins a 60-day formal period of negotiation during which the EPA is not allowed to start work at a site or initiate enforcement actions against potentially responsible parties, although the EPA may undertake certain investigatory and planning activities.

The 60-day period may be extended if the EPA receives a good faith offer from the PRPs within that period. [See also Good Faith Offer].

On-Scene Coordinator (OSC): The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil- or hazardous-spill corrective actions.

Operation and Maintenance: Activities conducted at a site after a cleanup action is completed to ensure that the cleanup or containment system is functioning properly.

Organic Chemicals/Compounds: Chemical substances containing mainly carbon, hydrogen, and oxygen.

Outfall: The place where wastewater is discharged into receiving waters.

Overpacking: Process used for isolating large volumes of waste by jacketing or encapsulating waste to prevent further spread or leakage of contaminating materials. Leaking drums may be contained within oversized barrels as an interim measure prior to removal and final disposal.

Pentachlorophenol (PCP): A synthetic, modified petrochemical that may be used as a wood preservative because of its toxicity to termites and fungi. It is a common component of creosotes and can cause cancer.

Perched (groundwater): Groundwater separated from another underlying body of groundwater by a confining layer, often clay or rock.

Percolation: The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing downward to groundwater.

Pesticide: A substance or mixture of substances intended to prevent, destroy, or repel any pest. If misused, pesticides can accumulate in the foodchain and contaminate the environment.

Petrochemicals: Chemical substances produced from petroleum in refinery operations and as fuel oil residues. These include fluoranthene, chrysene, mineral spirits, and refined oils. Petrochemicals are the bases from which volatile organic compounds (VOCs), plastics, and many pesticides are made. These chemical substances often are toxic to humans and the environment.

Phenols: Organic compounds that are used in plastics manufacturing and are by-products of petroleum refining, tanning, textile, dye, and resin manufacturing. Phenols are highly poisonous.

Physical Chemical Separation: The treatment process of adding a chemical to a substance to separate the compounds for further treatment or disposal.

Pilot Testing: A small-scale test of a proposed treatment system in the field to determine its ability to clean up specific contaminants.

Plugging: The process of stopping the flow of water, oil, or gas into or out of the ground through a borehole or well penetrating the ground.

Plume: A body of contaminated groundwater flowing from a specific source. The movement of the groundwater is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants [see Migration].

Pollution: Generally, the presence of matter or energy whose nature, location, or quantity produces undesired health or environmental effects.

Polycyclic Aromatic Hydrocarbons or Polyaromatic Hydrocarbons (PAHs): PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

Polychlorinated Biphenyls (PCBs): A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, microscope immersion oils, and caulking compounds. PCBs also are produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Chronic exposure to PCBs is believed to cause liver damage. It also is known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

Polynuclear Aromatic Hydrocarbons (PNAs): PNAs, such as naphthalene, and biphenyls, are a group of highly reactive organic compounds that are a common component of creosotes, which can be carcinogenic.

Polyvinyl Chloride (PVC): A plastic made from the gaseous substance vinyl chloride. PVC is used to make pipes, records, raincoats, and floor tiles. Health risks from high concentrations of vinyl chloride include liver cancer and lung cancer, as well as cancer of the lymphatic and nervous systems.

Potable Water: Water that is safe for drinking and cooking.

Potentially Responsible Parties (PRPs): Parties associated with a Superfund site who may be liable for the cost of remedying the release of hazardous substances. This may include owners or operators of the site or transporters who disposed of materials at the site. PRPs may admit liability, or liability may be determined by a court of law. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in the site cleanup without admitting liability.

Precipitation: The removal of solids from liquid waste so that the solid and liquid portions can be disposed of safely; the removal of particles from airborne emissions. Electrochemical precipitation is the use of an anode or cathode to remove the hazardous chemicals. Chemical precipitation involves the addition of some substance to cause the solid portion to separate.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release to determine if a threat or potential threat exists.

Pump and Treat: A groundwater cleanup technique involving the extracting of contaminated groundwater from the subsurface and the removal of contaminants, using one of several treatment technologies.

Radionuclides: Elements, including radium and uranium-235 and -238, which break down and produce radioactive substances due to their unstable atomic structure. Some are man-made, and others are naturally occurring in the environment. Radon, the gaseous form of radium, decays to form alpha particle radiation, which cannot be absorbed through skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Radiation also occurs naturally through the breakdown of granite.

RCRA: [See Resource Conservation and Recovery Act].

Recharge Area: A land area where rainwater saturates the ground and soaks through the earth to reach an aquifer.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used to clean up sites listed on the NPL. It is based on information generated during the remedial investigation and feasibility study and consideration of public comments and community concerns.

Recovery Wells: Wells used to withdraw contaminants or contaminated groundwater.

Recycle: The process of minimizing waste generation by recovering usable products that might otherwise become waste.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup following the remedial design [see Cleanup].

Remedial Design: A phase of site cleanup where engineers design the technical specifications for cleanup remedies and technologies.

Remedial Investigation: An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish the criteria for cleaning up the site, identify the preliminary alternatives for cleanup actions, and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. In this volume, the remedial investigation is referred to as a site study [see also Feasibility Study].

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing cleanup actions at the site.

Remedy Selection: The selection of the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected [see Record of Decision].

Removal Action: Short-term immediate actions taken to address releases of hazardous substances [see Cleanup].

Residual: The amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or the particulates remaining in air after the air passes through a scrubber.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Retention Pond: A small body of liquid used for disposing of wastes and containing overflow from production facilities. Sometimes retention ponds are used to expand the capacity of such structures as lagoons the store waste.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land and spread contaminants from its source.

Scrubber: An air pollution control device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

Sediment: The layer of soil, sand, and minerals at the bottom of surface waters such as streams, lakes, and rivers, that absorbs contaminants.

Seeps: Specific points where releases of liquid, usually leachate, form from waste disposal areas, particularly along the lower edges of landfills.

Seepage Pits: A hole, shaft, or cavity in the ground used for the storage of liquids, usually in the form of leachate, from waste disposal areas. The liquid gradually leaves the pit by moving through the surrounding soil.

Septage: Residue remaining in a septic tank after the treatment process.

Sinkhole: A hollow depression in the land surface in which drainage collects; associated with underground caves and passages that facilitate the movement of liquids.

Site Characterization: The technical process used to evaluate the nature and extent of environmental contamination, which is necessary for choosing and designing cleanup measures and monitoring their effectiveness.

Site Inspection: The collection of information from a hazardous waste site to determine the extent and severity of hazards posed by the site. It follows, and is more extensive than, a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if the site presents an immediate threat that requires a prompt removal action.

Slag: The fused refuse or dross separated from a metal in the process of smelting.

Sludge: Semi-solid residues from industrial or water treatment processes that may be contaminated with hazardous materials.

Slurry Wall: Barriers used to contain the flow of contaminated groundwater or subsurface liquids. Slurry walls are constructed by digging a trench around a contaminated area and filling the trench with an impermeable material that prevents water from passing through it. The groundwater or contaminated liquids trapped within the area surrounded by the slurry wall can be extracted and treated.

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate the metal. Emissions from smelters are known to cause pollution.

Soil Gas: Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Vapor Extraction: A treatment process that uses vacuum wells to remove hazardous gases from soil.

Soil Washing: A water-based process for mechanically scrubbing soils in-place to remove undesirable materials. There are two approaches: dissolving or suspending them in the wash solution for later treatment by conventional methods, and concentrating them into a smaller volume of soil through simple particle size separation techniques [see Solvent Extraction].

Stabilization: The process of changing an active substance into inert, harmless material, or physical activities at a site that act to limit the further spread of contamination without actual reduction of toxicity.

Solidification/Stabilization: A chemical or physical reduction of the mobility of hazardous constituents. Mobility is reduced through the binding of hazardous constituents into a solid mass with low permeability and resistance to leaching.

Solvent: A substance capable of dissolving another substance to form a solution. The primary uses of industrial solvents are as cleaners for degreasing, in paints, and in pharmaceuticals. Many solvents are flammable and toxic to varying degrees.

Solvent Extraction: A means of separating hazardous contaminants from soils, sludges, and sediment, thereby reducing the volume of the hazardous waste that must be treated. It generally is used as one in a series of unit operations. An organic chemical is used to dissolve contaminants as opposed to water-based compounds, which usually are used in soil washing.

Sorption: The action of soaking up or attracting substances. It is used in many pollution control systems.

Special Notice Letter: [See Notice Letter].

Stillbottom: Residues left over from the process of recovering spent solvents.

Stripping: A process used to remove volatile contaminants from a substance [see Air Stripping].

Sumps: A pit or tank that catches liquid runoff for drainage or disposal.

Superfund: The program operated under the legislative authority of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) to update and improve environmental laws. The program has the authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The "Superfund" is a trust fund that finances cleanup actions at hazardous waste sites.

Surge Tanks: A holding structure used to absorb irregularities in flow of liquids, including liquid waste materials.

Swamp: A type of wetland that is dominated by woody vegetation and does not accumulate peat moss deposits. Swamps may be fresh or saltwater and tidal or non-tidal [see Wetlands].

Thermal Treatment: The use of heat to remove or destroy contaminants from soil.

Treatability Studies: Testing a treatment method on contaminated groundwater, soil, etc., to determine whether and how well the method will work.

Trichloroethylene (TCE): A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

Unilateral [Administrative] Order: [see Administrative Order].

Upgradient: An upward hydrologic slope; demarks areas that are higher than contaminated areas and, therefore, are not prone to contamination by the movement of polluted groundwater.

Vacuum Extraction: A technology used to remove volatile organic compounds (VOCs) from soils. Vacuum pumps are connected to a series of wells drilled to just above the water table. The wells are sealed tightly at the soil surface, and the vacuum established in the soil draws VOC-contaminated air from the soil pores into the well, as fresh air is drawn down from the surface of the soil.

Vegetated Soil Cap: A cap constructed with graded soils and seed for vegetative growth, to prevent erosion [see Cap].

Vitrification: The process of electrically melting wastes and soils or sludges to bind the waste in a glassy, solid material more durable than granite or marble and resistant to leaching.

Volatile Organic Compounds (VOCs): VOCs are manufactured as secondary petrochemicals. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and groundwater.

Waste Treatment Plant: A facility that uses a series of tanks, screens, filters, and other treatment processes to remove pollutants from water.

Wastewater: The spent or used water from individual homes or industries.

Watershed: The land area that drains into a stream or other water body.

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

Wetland: An area that is regularly saturated by surface or groundwater and, under normal circumstances, is capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are nontidal and freshwater. Coastal wetlands are an integral component of estuaries.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Some Common Contaminants at NPL Sites

Contaminant Category	Example Chemical Types	Sources	Potential Health Threats*
Heavy Metals	Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Lead, Manganese, Mercury, Nickel, Silver, Selenium, Zinc	Electroplating, batteries, paint pigments, photography, smelting, thermometers, fluorescent lights, solvent recovery	Tumors, cancers, and kidney, brain, neurological, bone and liver damage
Volatile Organic Compounds (VOCs)	Trichloroethylene (TCE), Perchloroethylene (PCE), Acetone, Benzene, Ketone, Methyl chloride, Toluene, Vinyl Chloride, Dichlorethylene	Solvents and degreasers, gasoline octane enhancers, oils and paints, dry cleaning fluids, chemical manufacturing.	Cancers, kidney and liver damage, impairment of the nervous system resulting in sleepiness and headaches, leukemia
Pesticides/ Herbicides	Chlordane, DDT 4-4, DDE, Heptachlor, Aldrin, Endrin, Atrazine, Dieldrin, Toxaphene	Agricultural applications, pesticide and herbicide production	Various effects ranging from nausea to nervous disorders. Dioxin is a common by-product of the manufacture of pesticides and is both highly toxic and a suspected carcinogen.
Polychlorinated biphenyls (PCBs)	—	Electric transformers and capacitors, insulators and coolants, adhesives, caulking compounds, carbonless copy paper, hydraulic fluids.	Cancer and liver damage.
Creosotes	Polyaromatic hydrocarbons (PAHs), Polynuclear aromatics (PNAs), Phenolic Tars, Pentachlorophenol (PCP)	Wood preserving, fossil fuel combustion	Cancers and skin ulcerations with prolonged exposure
Radiation (Radionuclides)	Radium-226, Radon, Uranium-235, Uranium-238	Mine tailings, radium products, natural decay of granites	Cancer

Sources: *Toxic Chemicals—What They Are, How They Affect You (EPA, Region 5)*
Glossary of Environmental Terms (EPA, 1988)

**The potential for risk due to these contaminants is linked to a number of factors; for example, the length and level of exposure and environmental and health factors such as age.*

*U.S. G.P.O.:1993-341-835:81016